

## Redneck Lupines on a Roll: Breeding Advances in the genus *Baptisia*®

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### INTRODUCTION

My love for baptisias began many years ago, but it was in 1994 that I went off the proverbial deep end for this herbaceous genus of glorified peas in the family Fabaceae (Leguminosae). Perhaps it was my numerous unsuccessful attempts to grow other Fabaceae genera such as *Lupinus* that led me to the virtually indestructible genus *Baptisia* and its 16 currently recognized species. It is obvious from their native range that baptisias are extraordinarily drought tolerant lovers of hot weather. Consequently, gardeners growing them in cool climates will benefit from siting them in the hottest of garden locations.

*Baptisia* is an Eastern North American genus of prairie plants that range from Canada south to Florida and west to Texas. The genus *Baptisia* made its debut in 1808, although it was not formalized until 1811 by Robert Brown. Species that had been described decades earlier under the genera *Sophora* and *Crotalaria* slowly began their migration into the new genus. While taxonomy in *Baptisia* has come a long way, there are still differing opinions between taxonomic lumpers and splitters.

My study of the genus was greatly aided by the 1940 *Baptisia* monograph, authored by the late botanist Mary Maxine Larisey, former instructor at Wellesley College. The monograph is particularly detailed, not only with species descriptions, but with locations of each population. By the end of 2005, I had made 31 trips across the U.S. to find and collect baptisia specimens. When we travel in flower season, we collect cuttings, while later season trips are for seed collections.

You may find it strange that plants documented from the 1930s can still be found in their original locations, but fortunately, baptisias often grow in areas now used for livestock production or military bases. Since baptisia are unpalatable to livestock and durable to tanks, many of our best specimens are from the midst of extensive fields. Many farmers have fortunately given up trying to rid their fields of these “weeds.” I have certainly tried to do my part to help and have more than one unintentional barbed wire tattoo to remind me of that effort.

*Baptisia* foliage is primarily trifoliolate with the exception of three simple-leaf species: *B. arachnifera*, *B. simplicifolia*, and *B. perfoliata*. *Baptisia* species come in three basic flower colors: blue, white, and yellow (creamy and bright). Now that some of the natural hybrids are being propagated as well as intentional crosses made, it won't be long before we see reds and pinks joining the mix. Although the blue species are best known in gardens, they are in actuality the rarest color in the genus. The flowering time for baptisia is from late March to August, while their floral display ranges from terminal inflorescences to axillary flowers.

### THE BLUE-FLOWERED SPECIES

The most commonly cultivated baptisia is *B. australis*. While *B. australis* is certainly a garden worthy plant, it is far from being the star of the genus. Native to riverbanks from Vermont south to the Shenandoah Valley of Virginia, *B. australis*

is one of the larger species, making a 0.9 m (3 ft) tall × 1.5 to 1.8 m (5 to 6 ft) wide mound of glaucous blue-green foliage. The flower spikes emerge atop the newly emerging foliage in mid-April. By late April, the flowers begin to open, ranging from a good blue to purple color. Most seed strains of *B. australis* produce tall flower spikes, which, like a good drunk, can become a bit wobbly with age.

The most garden-worthy of the blue-flowered species is *B. minor*. *Baptisia minor* is virtually unknown commercially, because some moth-ball-inhaling herbarium taxonomist decided it was synonymous with *B. australis*. A few taxonomists still call it a subspecies of *B. australis*, while many now elevate it to species status, with which we concur. The disjunct U.S. East Coast remnant populations are now considered *B. minor* var. *aberrans*, while the main U.S. Midwest populations are now *B. minor* var. *minor*.

*Baptisia minor* is a much smaller plant than *B. australis*, rarely exceeding 0.6 m (2 ft) tall. The leaves are much smaller, presenting a more lacy textural appearance. The best feature of *B. minor* is the 30 to 46 cm (12 to 18 inch) tall spikes of large blue or lavender flowers, which don't become lax like *B. australis*. I enjoy *B. minor* in seed as well, since the huge pods turn a magnificent pure black when mature. In the wild, a clump of *B. minor* will usually have only two to five flower spikes, a number that increases slightly in cultivation. We grew seed from numerous populations and have so far selected one cultivar, *B. minor* 'Blue Pearls', from a collection north of Dallas, Texas. *Baptisia minor* 'Blue Pearls' is significantly more floriferous than typical, with over 50 flowers spikes per plant.

One of my most exciting baptisia finds occurred when a North Carolina botanist friend, Craig Moretz, took me to a remote population where we found three pink-flowering plants of *Baptisia minor*. We were successful in propagating these from cuttings and now have them on trial.

## THE WHITE-FLOWERED SPECIES

The white-flowered species have suffered from being taxonomically muddled. Due to errors in the original 1940 monograph, incorrect names have made their way into the trade and have left gardeners wondering exactly which white baptisia they are growing. The most commonly seen names are *B. alba*, *B. leucantha*, and *B. pendula*. When the smoke from the taxonomist guns had cleared, *B. alba* became *B. albescens*, *B. leucantha* became *B. alba* var. *macrophylla*, and *B. pendula* became *B. alba* var. *alba*. The white-flowered species are much later flowering than most of the blue- or yellow-flowered species, with only a few exceptions. *Baptisia alba* var. *macrophylla* (formerly *B. leucantha*) has a huge native range from Minnesota south to Tennessee. It is also one of the tallest species, ranging from 1.5 to 2.1 m (5 to 7 ft) tall. Although each clump doesn't produce many flower spikes, the ones that are produced are stunningly beautiful. Plants from the northern end of the range do not emerge until June, while plants from the southern end of the range emerge in late April.

*Baptisia alba* var. *alba* (formerly *B. pendula*), or thick pod wild indigo, is the southeastern form of *B. alba*. It is easily recognizable from *B. alba* var. *macrophylla* (*B. leucantha*) due to its large black pendant seed pods and shorter stature to 0.9 to 1.5 m (3 to 5 ft) tall. It is native throughout the southeast from North Carolina to Florida. After growing plants from across the range, we introduced a stunning 1.5-m-tall (5-ft-tall) selection from a population in Wayne County, North Carolina, that we named *B. alba* 'Wayne's World'.

A third white species is the southeastern native, *Baptisia albescens* (formerly *B. alba*), ranging from Tennessee to Florida. This airy-textured species is prized both for its smaller leaves and shorter stature, usually 1.2 m (4 ft) tall or less. It can be distinguished from the other white-flowered species by its narrow seed pod that turns tan when dry instead of black. One *Baptisia albescens* specimen that I saw in central North Carolina was growing 2.1 m (7 ft) tall on a dry road bank; just imagine what it would do in good garden conditions.

### THE CREAMY YELLOW-FLOWERED SPECIES

One of my favorites is the little known *B. bracteata*. *Baptisia bracteata* is often divided into two varieties: *B. bracteata* var. *bracteata* and *B. bracteata* var. *leucophaea* (syn: *B. leucophaea*). *Baptisia bracteata* var. *leucophaea* occurs from Texas north to Minnesota, while *B. bracteata* var. *bracteata* is its southern counterpart and only occurs from North Carolina south to Alabama.

All members of the “bracteata” group are very early flowering, often starting in late March to early April in North Carolina. Instead of having upright flower stalks, they emerge horizontally like giant clusters of creamy-yellow grapes. Many regional forms of *B. bracteata* var. *leucophaea* emerge with a dark purple cast to the new foliage that disappears as they come into flower. We have introduced a very dwarf form that we found in Oklahoma under the name *B.* ‘Little Texas’, and will follow up shortly with an extraordinarily heavy flowering form named *B.* ‘Butterball’.

While most of the light-yellow-flowered species have pendulous inflorescences, *B. nuttalliana* is an exception. Although the May-produced light-yellow flowers of this deep southeastern U.S.A. species are axillary, their naturally spherical form gives them good garden presence. We hope to have a vegetatively propagated selection of this species to market in the near future.

### THE BRIGHT YELLOW-FLOWERED SPECIES

It’s easy to agree that the most horticulturally worthy of the yellow-flowering species is *B. sphaerocarpa* (syn: *B. viridis*). It’s hard to find any other *Baptisia* that has as much flower power as this species, found from Texas to Missouri. In situ, it grows as well in dry fields as in wet swales. In cultivation, a single specimen will attain a height of 76 cm (30 inches) with a spread of 0.9 m (3 ft) and can produce over 130 flower spikes at once! When *B. sphaerocarpa* comes into flower in mid- to late April with its large bright yellow flowers, it’s truly a photographic moment. After flowering, *B. sphaerocarpa* produces its namesake distinctive, nearly indestructible, spherical marble-size seed pods. *Baptisia sphaerocarpa* ‘Screamin’ Yellow’ (1996) is a green-leaf selection from Arkansas introduced by native plant expert Larry Lowman. The Arkansas forms are distinguished from the narrower and more glaucous foliage that the species possesses as it moves south into southern Oklahoma and Texas.

While none of the other yellow species are as showy in flower, there are certainly some that stand out for their foliage. The rare coastal Georgia native *B. arachnifera* is so rare that it has been declared a U.S. Federally Endangered Species. If you can manage to find nursery-propagated *B. arachnifera* for your garden, select an open spot in the rock garden for best performance. *Baptisia arachnifera* has round silvery webbed foliage on a small plant that rarely exceeds 38 cm (15 inches) in height. The inconspicuous small yellow flowers appear in the leaf axils in August.

*Baptisia perfoliata* is another unique foliage specimen. This glaucous green-foliaged endemic to a couple of southern highways, in particular Interstate 20 in South Carolina and Georgia, is also often mistaken for eucalyptus. Clumps of *B. perfoliata* will eventually make a 0.7-m (30-inch) tall × 0.9-m (3-ft) wide clump of amazing foliage. The April-produced axillary yellow flowers give way to small round seed pods that dry next to the leaf. The foliage of *B. perfoliata* turns brown in late summer, leaving amazing brown eucalyptus-looking stems that have tremendous floral arrangement possibilities. We have introduced a particularly vigorous selection from an herbicide-decimated South Carolina population that we named *B. perfoliata* 'Survivor'.

For small spaces, the North and South Carolina sandhills and coastal plains native, *B. cinerea*, is a great choice, but one that is often overlooked. It resembles a short and less showy *B. bracteata* var. *leucophaea* that rarely exceeds 30 cm (1 ft) in height, and is adorned with horizontal flower panicles of bright yellow in early spring, usually April. The more southerly version of *B. cinerea* is *B. lanceolata*, which is found from Georgia south to Florida. It also produces interesting small spikes of bright yellow flowers in April/May. Both of these species go dormant early, and the foliage turns brown, often by August.

Another good garden specimen is the widespread *B. tinctoria*, which ranges from Canada to Georgia. The tiny foliage and equally small terminal spike of yellow flowers are far from showy but serve as a wonderful 0.6- to 0.9-m (2- to 3-ft) tall border filler. Depending on which part of the range your plants originate, this species goes from being a tight clumper to a vigorous spreader. With a little selection for foliage and flowering characteristics, this airy-textured species could easily become a garden standard.

The other truly unique member of the genus is *B. simplicifolia*. This Florida endemic has not only proven reliably hardy in Zone 5, but has the strange habit of not emerging before July. While this is understandable for a Zone 5 native, it makes no sense for a plant from Florida. Our guess is that it was part of a larger ancient glaciation's dump from a more northern climate. Once it does emerge, the glossy green simple leaf looks very un-baptisia like. *Baptisia simplicifolia* is topped with terminal spikes of yellow from July to August in our garden.

## SELECTIONS AND HYBRIDS

In addition to species selections, several bi-specific hybrids have begun to enter the trade. Since baptisias are sexually quite promiscuous, there are probably many hybrids already present in gardens that are masquerading as species. Unfortunately, many of these hybrids are not improvements on the native species. There are, however, times when a hybrid is better than the parents, such as two introductions from the late Rob Gardner of the North Carolina Botanical Garden (NCBG) in Chapel Hill, North Carolina.

With an extensive baptisia collection in their garden, it should not be surprising that some horticultural hanky-panky would occur. The first introduction in 1996 was a cross between *B. minor* var. *aberrans* and *B. albescens*, which was given the name of *B.* 'Purple Smoke'. *Baptisia* 'Purple Smoke' picked up the tall charcoal flower stalk from *B. albescens* and the purple flower color from *B. minor*.

The second of the NCBG releases, introduced in 2002, is *B.* 'Carolina Moonlight', a cross between *B. sphaerocarpa* and *B. albescens*. This amazingly vigorous plant has upright spikes of light buttery yellow and is the first baptisia with creamy

yellow flowers held on anything other than a pendulous spike. Well-grown plants of either of these hybrids will hold their own against any lupine and, in time, will far bypass them in duration.

I am still amazed that *Baptisia* hybrids have not hit the market earlier, but this shows the lack of communication between botanists and horticulturists. In my early research, I read about a group of naturally occurring baptisia hybrids that were documented in Oklahoma and Texas as early as the late 1930s. After tracking down the 1996 Botanical Research Institute of Texas (BRIT) publication that showed color pictures of these same bicolor hybrids (blue and yellow and red and yellow), I was on the phone to the author to inquire about cuttings. I was told that the plants had been accidentally sprayed with weed killer the year prior by the landowner. But, the botanists proudly proclaimed, "We have dried herbarium specimens." How did these plants escape being propagated, while being known for 60 years?

On the bright side, we have since found a number of other naturally occurring hybrid populations and have now been able to duplicate the Texas hybrids in cultivation. *Baptisia* 'Chocolate Chip' from Minnesota's Hans Hansen was the first of these bicolor purple and yellow hybrids to enter the market in 2005.

Dr. Jim Ault of the Chicago Botanic Gardens released *B.* 'Midnite' in 2006, which we have just begun to grow. *Baptisia* 'Midnite', like many other bicolor F1 hybrids, produces short flower spikes that are covered by the emerging foliage. We have found that this trait can be minimized in the F2 and future generations. I look forward to growing more of his upcoming releases that have yet to be named.

We have now incorporated three to four species in many of our own hybrids and have an array of colors and forms, some of which may eventually reach the market. Although it's hard to imagine why it took so long for breeders to tackle this wonderful genus of plants, the future certainly looks bright.

## PROPAGATION

Propagation of baptisias is relatively easy once you understand a bit about the plants. Most baptisias are currently propagated from seed. This is fine as long as the seed blocks are isolated, but rarely is this the case. As I mentioned earlier, baptisia are very promiscuous in the garden, at least with other baptisia. I'll bet that if all the *B. australis* in gardens were DNA tested, few would be found as the true species.

Fresh sown baptisia seed germinates quite easy and quite fast, usually in 2 weeks. Old stored seed, on the other hand, is very difficult and slow to sprout. I recommend that all old baptisia seed be placed in a Styrofoam cup and doused in boiling water and allowed to cool prior to planting. This will begin to break down the seed coat and encourage germination. We have even tried this on seed that was sown but showed sporadic germination. Un-germinated seed were sifted from the potting mix, drenched with boiling water, and resown, with amazing results.

Another propagation method for baptisia is stem cuttings. Most baptisias root easy in late spring and early summer when the growth is soft, but the success rate drops off to zero as the plants harden. Cuttings should be dipped in a rooting hormone and then kept in high humidity until they root, usually about 8 weeks.

A commonly encountered problem with cutting-propagated baptisias is one of overwintering. If plants grown from cuttings do not get large enough before they go dormant, they will not produce enough energy to form new growth buds for the following spring.

Additionally, it is important to stick one to two nodes under the soil. If not, you will find a mass of roots in spring that will fail to send up any foliage. I like to keep newly rooted containerized plants in a warm greenhouse or on a windowsill until the new buds develop at the base, after which time they can be allowed to go dormant. New advances such as tissue culture propagation of baptisias have done wonders to increase numbers more rapidly and overcome some of the overwintering issues that we have faced with conventional cuttings.

With all the advances in selecting, breeding, and propagation of baptisias, the future of this genus looks very bright. Perhaps in a few more years, we'll be taking orders for the newly published "Gardener's Guide to Growing Baptisia" at our local Baptisia Society meeting.